

Claims

1. A fuel injection apparatus for an internal combustion engine, having a high-pressure pump (14) that supplies fuel at least indirectly to at least one injection point (18) associated with at least one cylinder (6) of the engine, having a fuel filter (26) preceding the high-pressure pump (14), which filters out impurities from the fuel and separates out free-floating water contained in the fuel and/or emulsified water, characterized in that free-floating and/or emulsified water separated out by the fuel filter (26) is at least indirectly supplied to the combustion chamber (40) of the at least one cylinder (6) of the engine.
2. The fuel injection apparatus according to claim 1, characterized in that the free-floating and/or emulsified water is supplied to an intake region (44) of the at least one cylinder (6) from which region combustion air is sucked into the combustion chamber (40) of the cylinder (6).
3. The fuel injection apparatus according to claim 2, characterized in that the free-floating and/or emulsified water is sprayed into the intake region (44) by means of a nozzle (50) or an injection valve (50).
4. The fuel injection apparatus according to claim 2 or 3, characterized in that the free-floating and/or emulsified water is supplied to the intake region (44) at least essentially only during the intake phase of the at least one cylinder (6).
5. The fuel injection apparatus according to one of the preceding claims, characterized in that the fuel filter (26) is situated downstream of a fuel supply pump (10) that supplies fuel to the

high-pressure pump (14) and the free-floating and/or emulsified water is conveyed out of the fuel filter (26) by the delivery pressure generated by the fuel supply pump (10).

6. The fuel injection apparatus according to one of claims 2 through 5, characterized in that an on-off valve (52) is provided in the connection (48) between the fuel filter (26) and the intake region (44).

7. The fuel injection apparatus according to one of claims 2 through 6, characterized in that the intake region (44) has a cross-sectional constriction (58) and the free-floating and/or emulsified water is supplied to the intake region (44) in its cross-sectional constriction (58).

8. The fuel injection apparatus according to one of claims 2 through 7, characterized in that an electronic control unit (22) controls the supply of the free-floating and/or emulsified water to the intake region (44) as a function of operating parameters of the engine.

9. The fuel injection apparatus according to claim 8, characterized in that free-floating and/or emulsified water is not supplied when the engine is in overrunning mode.

10. The fuel injection apparatus according to claim 8 or 9, characterized in that free-floating and/or emulsified water is only supplied at temperatures above the freezing point.

11. The fuel injection apparatus according to claim 8, characterized in that free-floating and/or emulsified water is supplied at least essentially only during a respective intake phase of the at least one cylinder (6) when the combustion air is being sucked from the intake region (44) into the combustion chamber (40) of the cylinder (5).

12. The fuel injection apparatus according to claim 8, characterized in that the electronic control unit (22) reduces the quantity of fuel injected at the at least one injection point (18) as a function of the quantity of free-floating and/or emulsified water supplied to the intake region (44).